



**Vala Afshar, Contributor**  
Chief Digital Evangelist, Salesforce

Blockchain (database)

Bitcoin

Cryptocurrencies

Startups



**What industries will the Blockchain disrupt?**

# Blockchain Will Disrupt Every Industry

07/10/2017 10:58 am ET

## 19 Industries The Blockchain Will Disrupt ★<sup>4</sup>

- "We believe that this new supply chain solution will be a transformative technology with the potential to completely disrupt and change the way global trade is done" (Bridget van Kralingen, Senior Vice President, Industry Platforms, IBM)

### Chains in Chains

Dr. Henrik Sternberg  
Iowa State University



IOWA STATE UNIVERSITY

# Blockchain + Supply chains

## ***=Disruption?***

- What are the implications for supply chain management?
  - Blockchain 101
  - Chains in chains – Theory and Practice
  - The background – unethical behavior in the road haulage industry
  - The “ReLog” Blockchain pilot (2015-2018)







**WESTERN  
UNION**

**Send warm  
wishes today.**

FOR ONLY SEND UP TO  
**\$5/\$50**

TRANSFER  
FEE

FOR PICKUP WITHIN THE U.S.

*moving money for better*

 **bitcoin**

**Send warm  
wishes 24/7.**

FOR ONLY SEND UP TO  
**\$0.01/\$ANY**

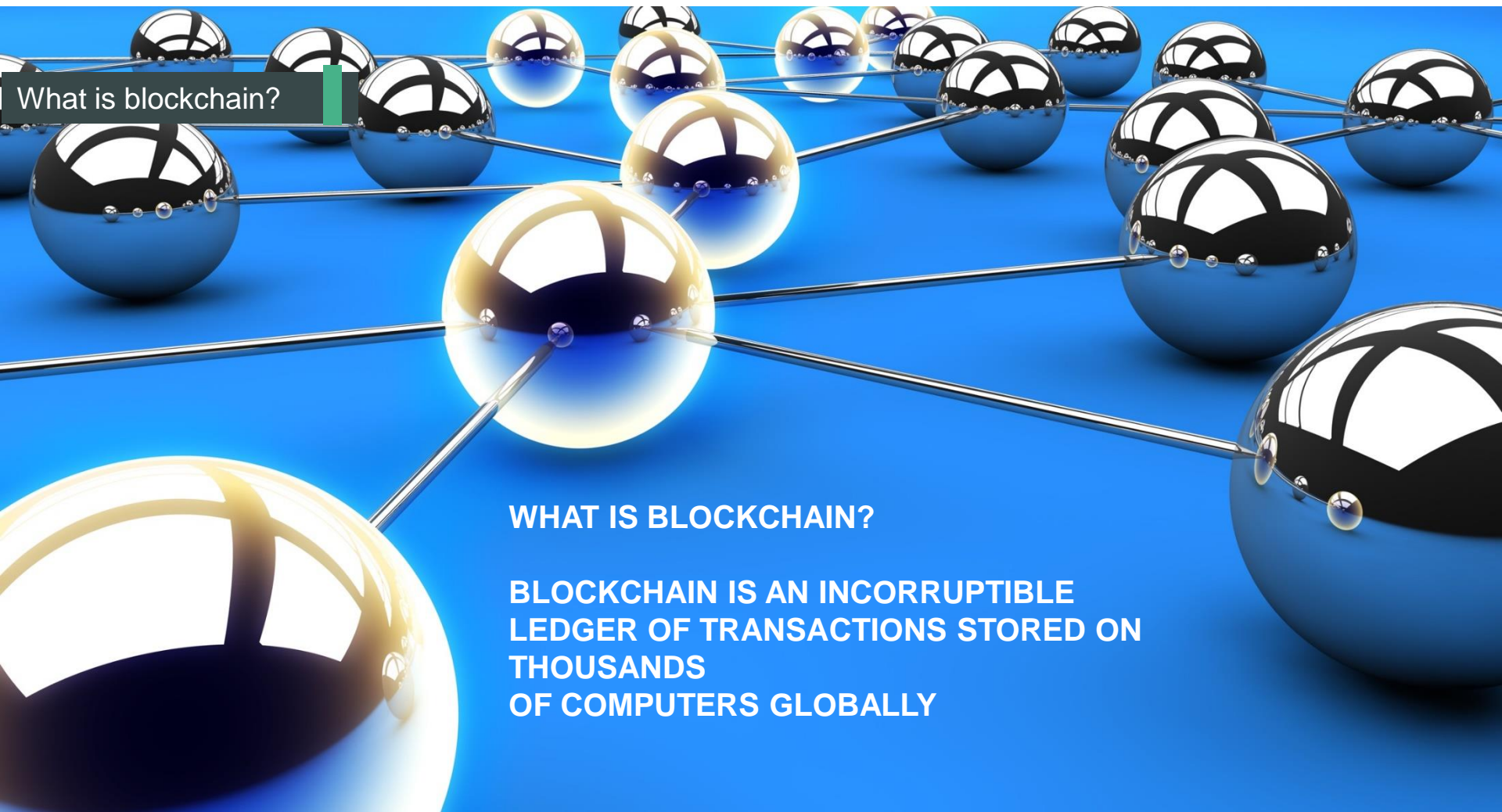
TRANSFER  
FEE

AMOUNT

FOR PICKUP **ANYWHERE**

*moving money far better*

IOWA STATE UNIVERSITY



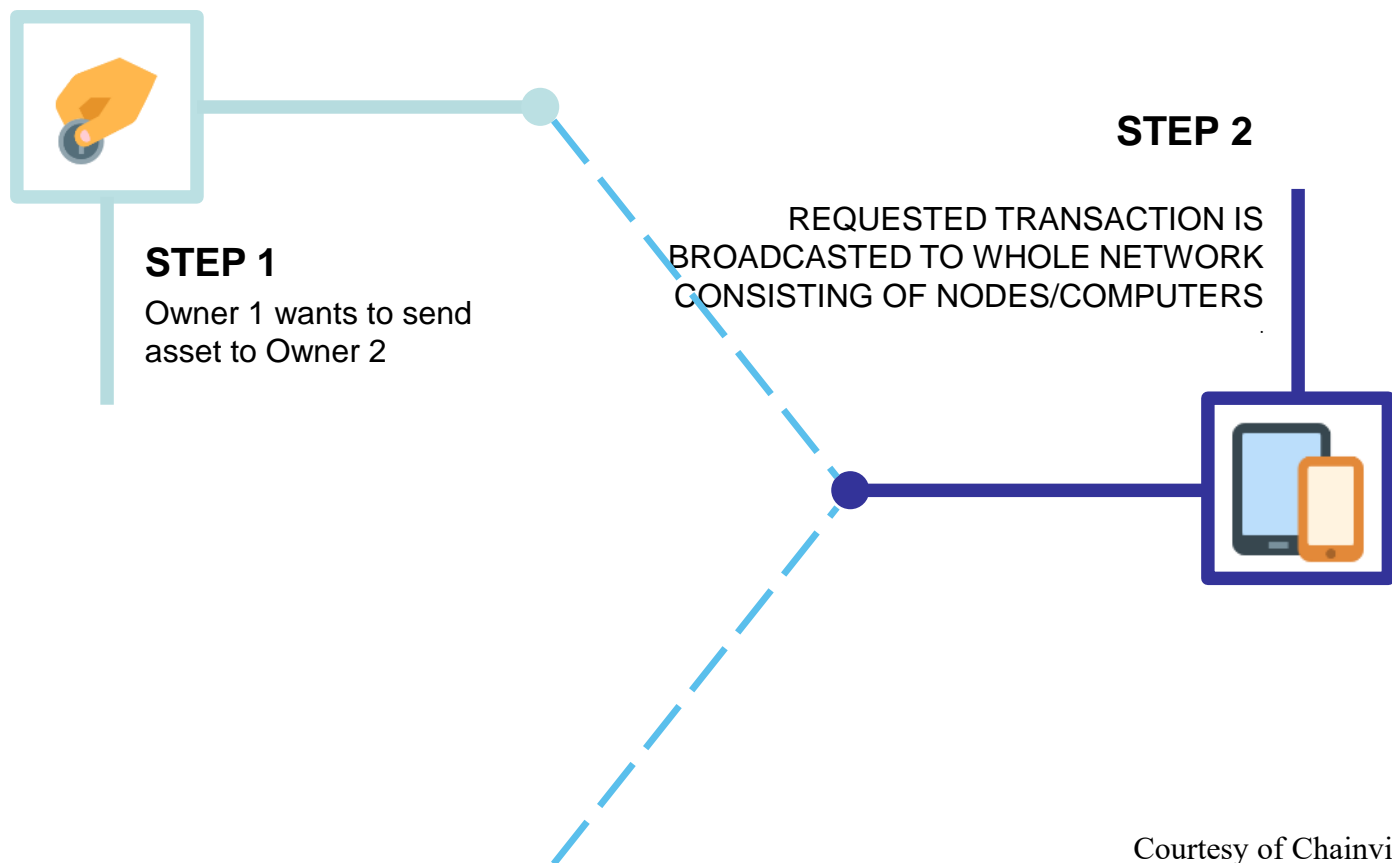
What is blockchain?

**WHAT IS BLOCKCHAIN?**

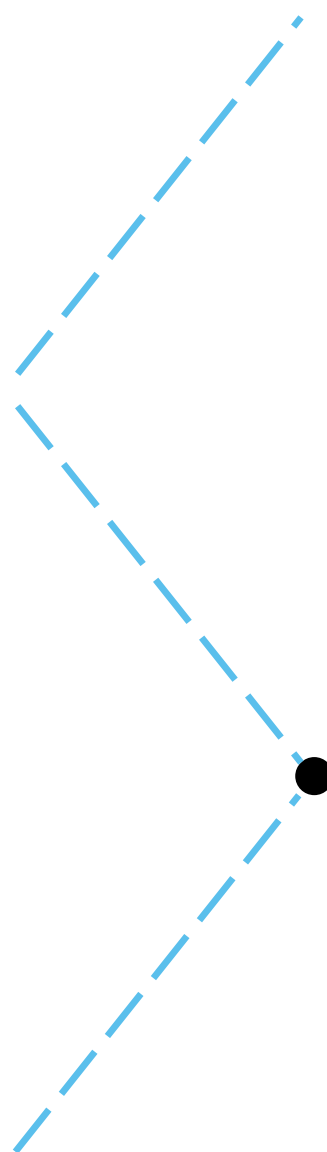
**BLOCKCHAIN IS AN INCORRUPTIBLE  
LEDGER OF TRANSACTIONS STORED ON  
THOUSANDS  
OF COMPUTERS GLOBALLY**

Courtesy of Chainvine

## TIMELINE AND DESCRIPTION



how does blockchain work?



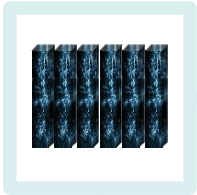
**STEP 3**  
THE NETWORK OF NODES  
VALIDATES TRANSACTIONS, USING  
KNOWN ALGORITHM.

ONCE VERIFIED THE TRANSACTION IS ADDED  
WITH OTHER TRANSACTIONS CREATING A  
NEW BLOCK OF DATA FOR THE LEDGER, NEW  
BLOCK ALSO CONTAINS SIGNATURE OF  
PREVIOUS BLOCK

**STEP 4**

The box contains an icon of two blue, textured blocks with a plus sign between them, representing a new block in the ledger.

how does blockchain work?



**STEP 5**

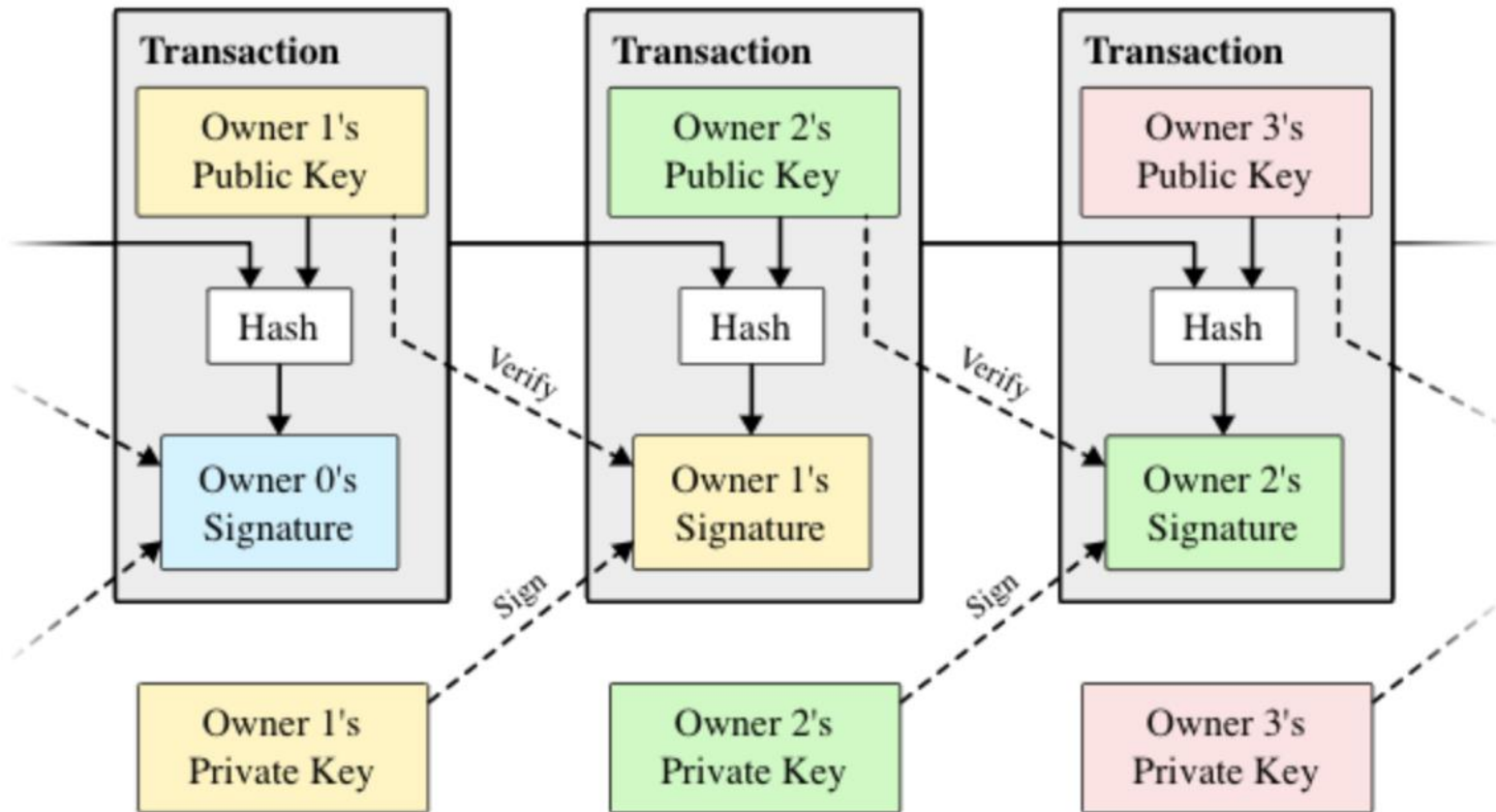
THE NEW BLOCK IS THEN ADDED  
TO THE BLOCKCHAIN THE BLOCK  
IS NOW IMMUTABLE MAKING IT  
PERMANENT & UNCHANGEABLE,  
NEW BLOCK IS COPIED TO ALL  
NODES

CHECK CONFIRMATION ON LEDGER  
TRANSACTION COMPLETE

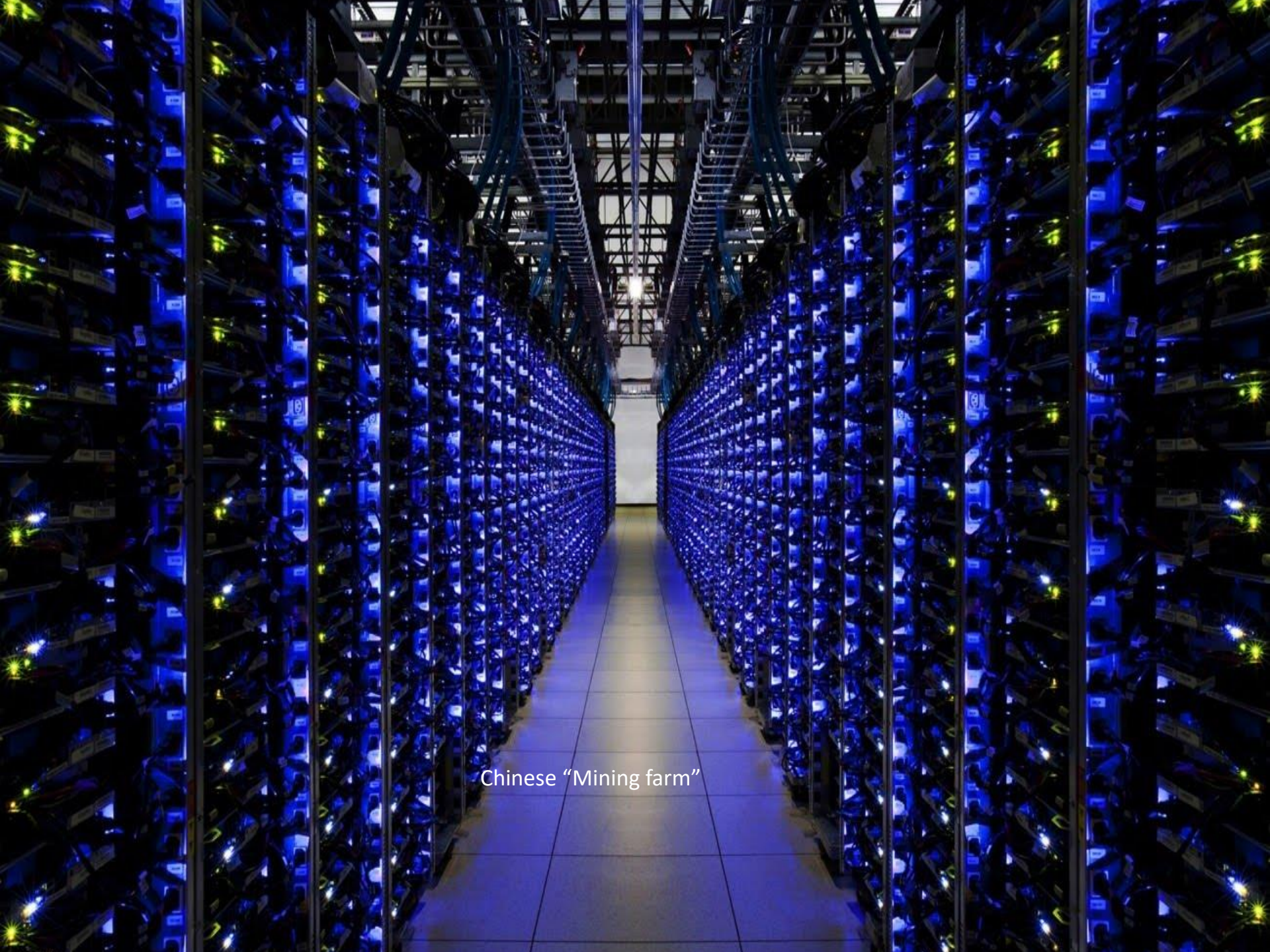
**STEP 6**







<https://blockonomi.com/what-is-bitcoin-ultimate-guide-beginners/>



Chinese “Mining farm”

# Chains in chains: Theory

- Korpela, Hallikas & Dahlberg et al. 2017:
  - Suggests blockchain can help overcome some challenges in intra-business information sharing, however standards work remain
- Hofmann et al. 2017: Supply chain finance
- Babich & Hilary 2019: Blockchain will transform supply and operations management



# Chains in Chains: Theory



Sent: Wednesday, November 20, 2019 10:47 PM

To: Sternberg, Steen-Henrik [SCM] <henrik@iastate.edu>

Subject: Journal of Business Logistics - Decision on Manuscript ID JBL-Aug-2018-7096.R1  
[email ref: DL-RW-2-a]

20-Nov-2019

Dear Colleague:

Your manuscript (ID JBL-Aug-2018-7096.R1), entitled "The Struggle is Real: Insights from a Supply Chain Blockchain Case," has been reviewed. The comments of the reviewer(s) are included at the bottom of this letter.

The reviewer(s) viewed your research positively and have recommended some minor revisions. We therefore invite you to revise and resubmit your manuscript.

- Wüst & Gervais 2017: *"Do you need a blockchain?"*



# Chains in Chains: Practice

# Chains in Chains: Practice Pilots

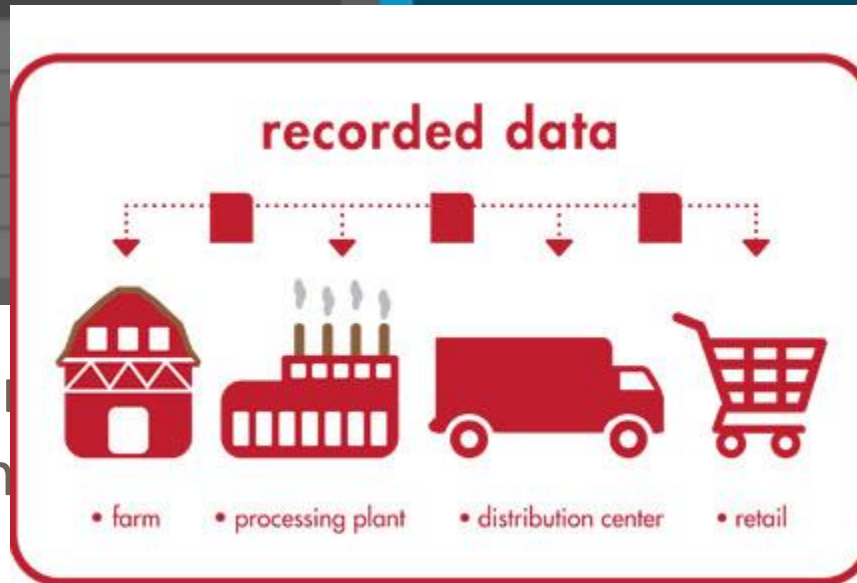
- IBM supply chain pilots
- Provenance
- Modum.io
- *ReLog*



Blockchain for  
Port of  
ombasa



- Packing List
- Commercial Invoice
- Certificate of Origin
- Phytosanitary Certificate
- Export License
- Bill of Lading



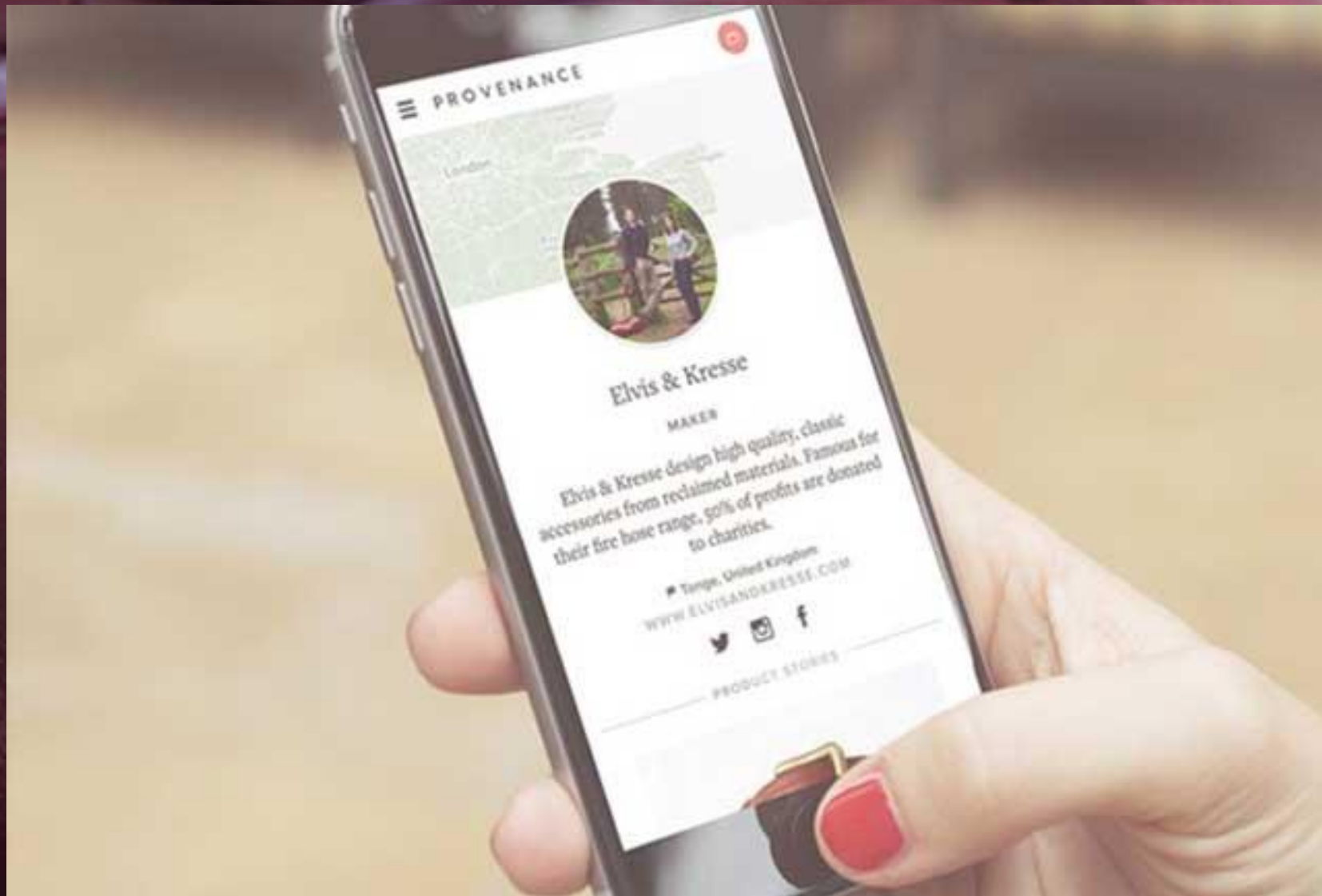
Packing List

packing-list.pdf

Submit

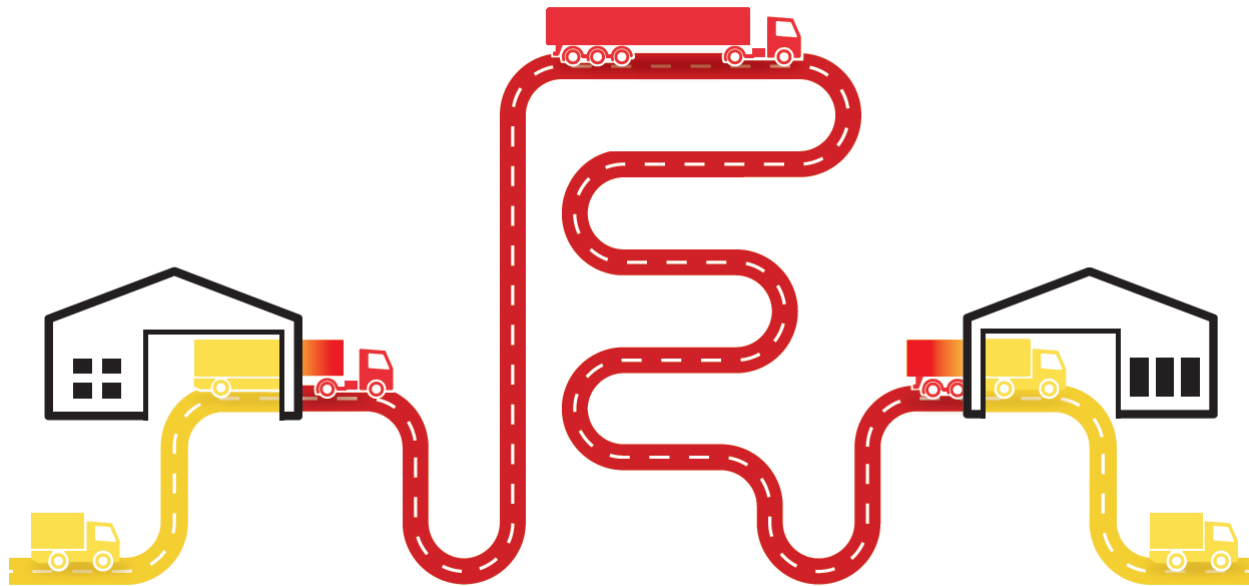
- IBM & Maer...
- information

many





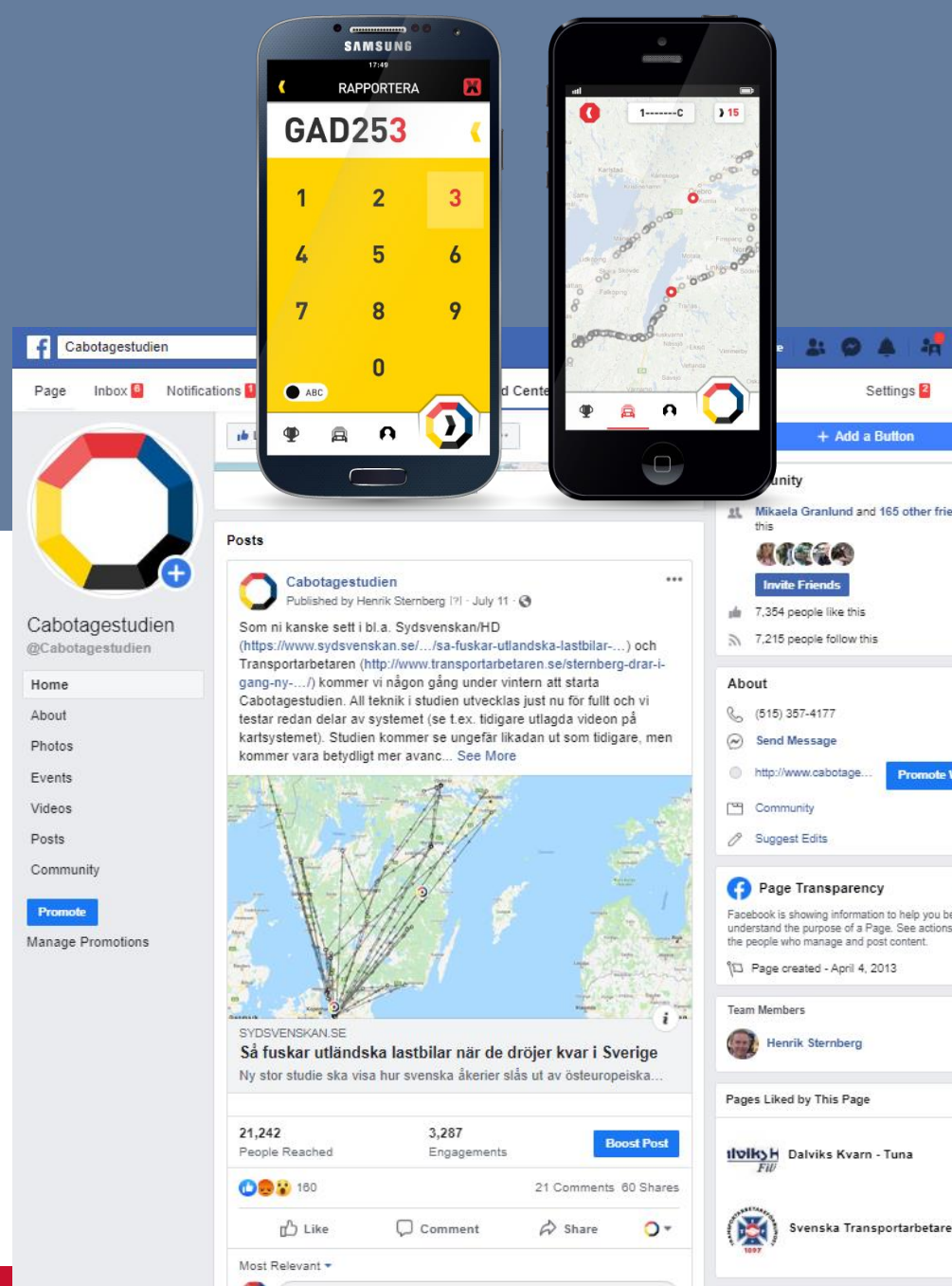
# ReLog: Background – lack of transparency



# Cabotagestudien

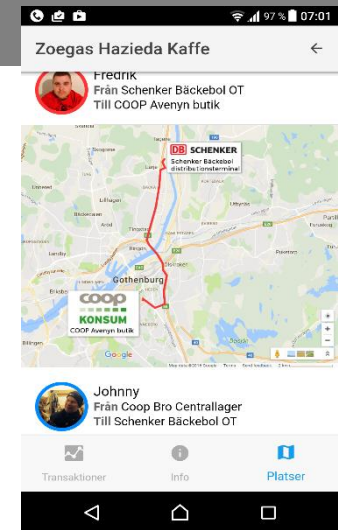
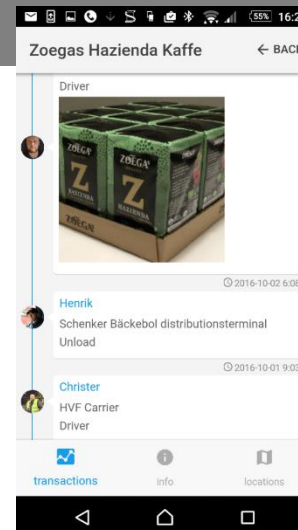
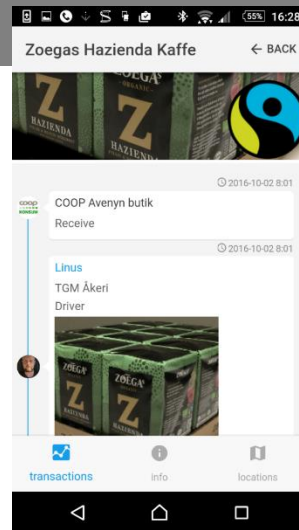
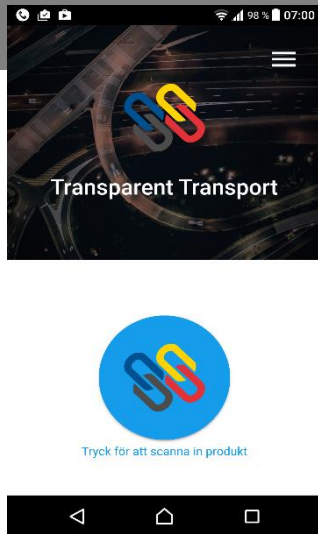


- Smartphone app:  
+600 000 position  
reports
- +4000 volunteers





# ReLog: Scan product/shelf to get transparency



0. Unloading



Bro

1. Prepare pallets



2. Load



3. Unload

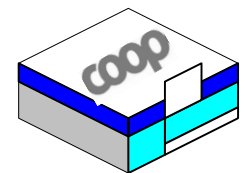


OT Gbg (Schenker)

4. Crossdocking



5. Load

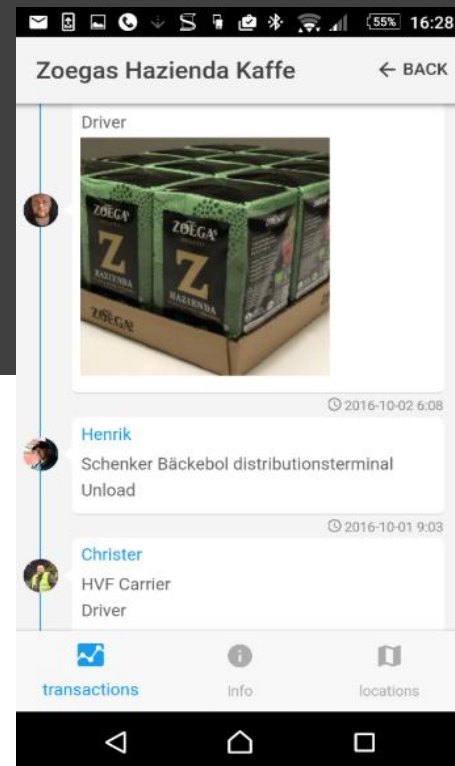


6. Unload COOP



# Pilot: Revelatory case study

Retailer 1	Head of logistics development Logistics developer Logistics CSR Head of transport purchasing
Retailer 2	Logistics developer Terminal manager
LSP 1	Head of quality Logistics developer (2) Head of network planning Account manager
LSP 2	Integration analyst Project manager (2)
LSP 3	Account manager
Haulier association	CEO Head of member relations
Environmental association	Head of freight sustainability certification
Transport booking provider	Head of enterprise customers Account manager Integration analysts (2)
Municipalities	Purchasing officers (2) Freight planner
Technology provider	Technology executive Nordic blockchain leader Lead architect
Technology consultancy	Technical architect Head of innovation Technical project leader



- 3 years and 3 proof of concepts
  - Interviews
  - Project meetings
  - Testing
- Conceptual work

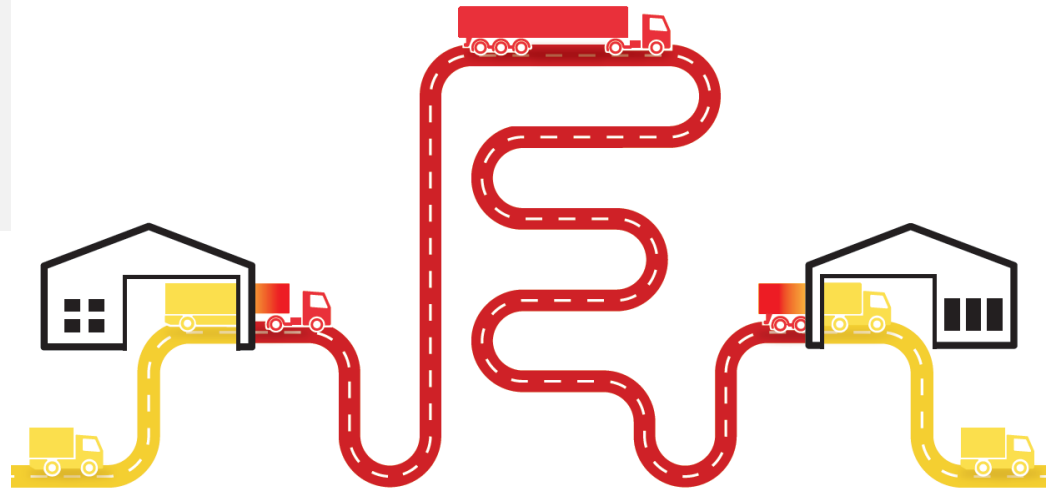
# A new app could make road freight more sustainable...



New app makes the transport industry transparent

- <https://www.youtube.com/watch?v=nWVdg6KU1MI&t=3s>

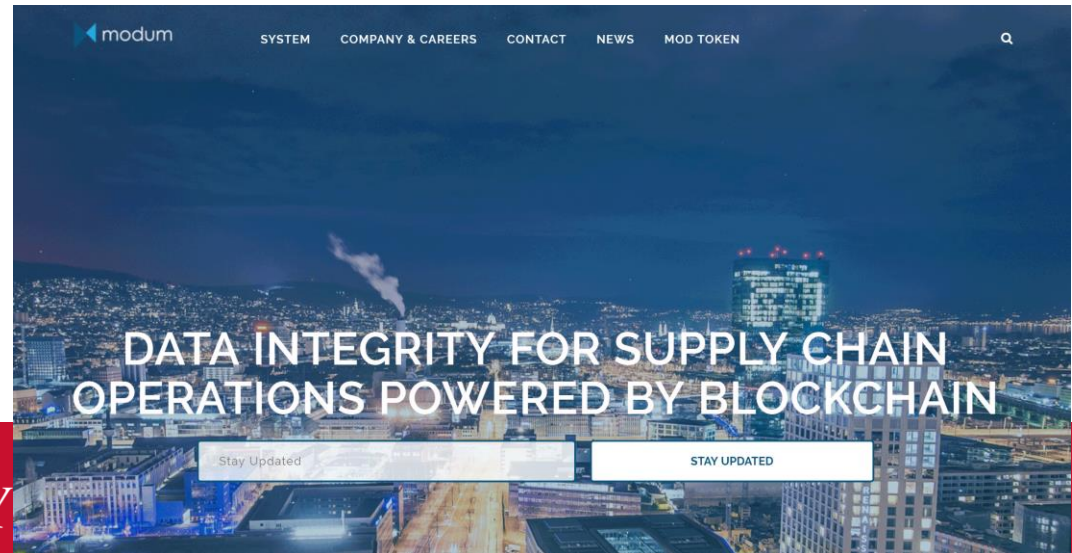
# Themes evolving



- System integration
- Supply chain workers:
  - Privacy
  - Involvement – data entry
- Need for blockchains?

# Blockchains for Coffee and chocolate

- 1. A created {chocolate: 210}
- 2. A created {coffee: 100}
- 3. A transferred [{coffee: 100}, {chocolate: 200}] to C
- 4. C aggregated [{coffee: 100}, {chocolate: 200}] to {shop\_cage[{coffee: 100}, {chocolate: 200}]: 1}
- 5. C transferred {shop\_cage[{coffee: 100}, {chocolate: 200}]: 1} to D
- 6. {shop\_cage[{coffee: 100}, {chocolate: 200}]: 1} is not active (*delivered to destination*)
- 7. {coffee: 100} is not active
- 8. {chocolate: 200} is not active



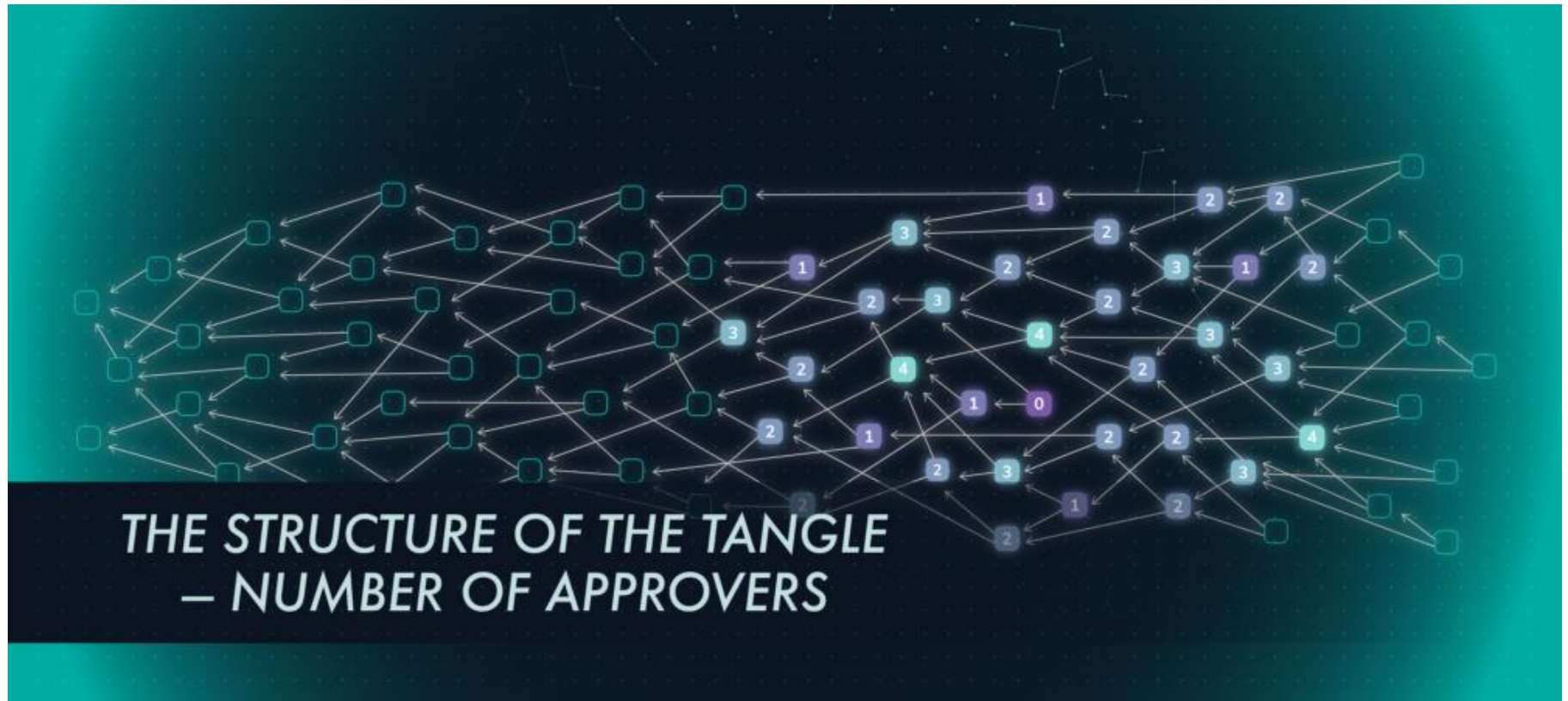


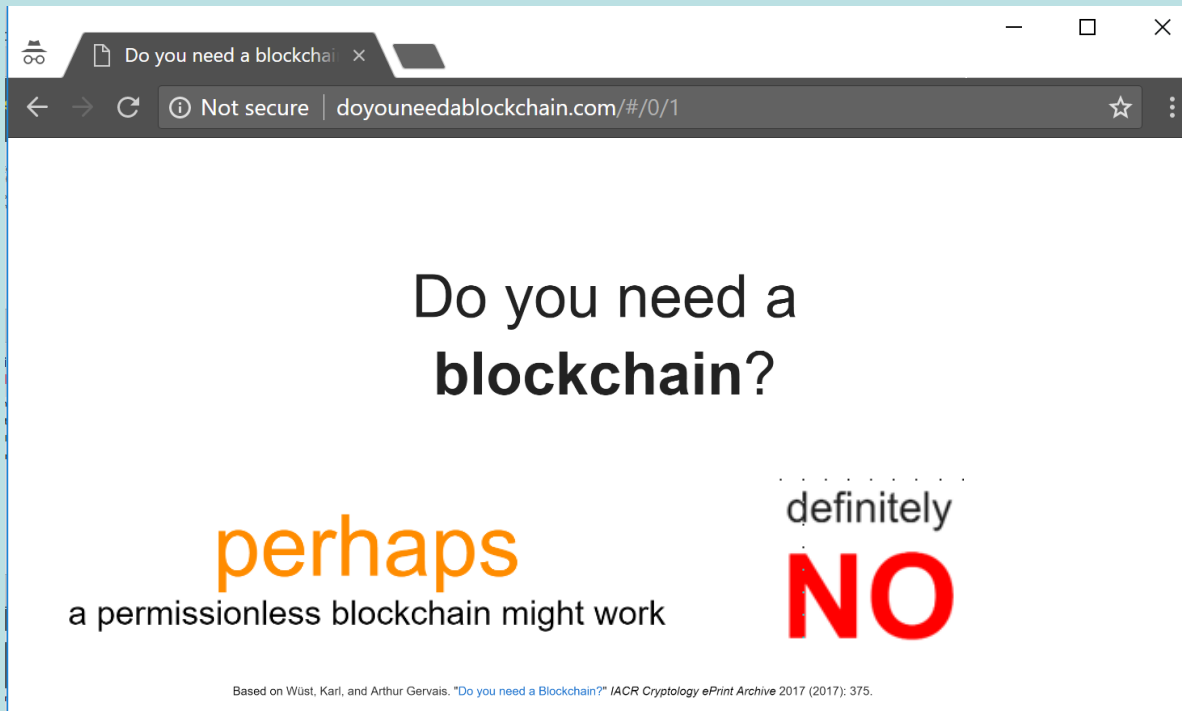
# The supply chain paradox of Blockchains in logistics

Blockchains will work when:

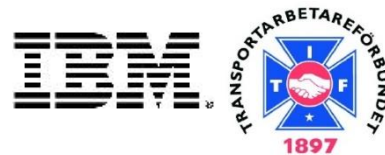
1. We can monitor the actual physical status and/or identity
2. Organizations are tightly coupled
3. Organizations are technologically advanced

# [M]IOTA – the alternative?





Thank you!  
**Questions?**  
Henrik@iastate.edu



Naturskyddsföreningen



IOWA STATE UNIVERSITY

# INTERNET OF LOGISTICS

## SOON A PACKAGE WILL BE ABLE TO DELIVER ITSELF...

... to any coordinates on the planet where it is needed. Because now, **anywhere** and **any place** can be a delivery location, and **everyone** and **everything** can be defined as transportation—that includes you on your walk from Piccadilly Circus to Trafalgar Square.



### Our Origin

Nebullam's genesis began as an idea to focus on food security and production, sustainably. That focus has evolved into our current mission statement; to

### Our Now

In order to prove out our technology and its place within indoor farming, we have become our own first customer.

Home

Nebullam Greens

Ne

*Autonomous logistics:*  
How do we create self-controlled deliveries of vegetables?



*Unethical  
behaviour:*

How can we stop  
the predatory truck  
towing of an  
occupied vehicle?

## The truck booting trap, and one small fleet owner's ongoing crusade for a solution

CHANNEL 19

Todd Dills | November 08, 2019



"This does not happen to cars, this does not happen to campers," says Leander Richmond of the phenomenon of private-lot booting of trucks in which drivers are sleeping, most often during federally mandated rest periods, of course. With parking pressures exacerbated in some senses by the electronic logging device mandate, drivers' willingness to utilize that last-resort spot on a given lot has in Richmond's view brought the predatory-boot issue to the fore. He's seen it in cases of his own 12 trucks' drivers from time to time, with fees to remove the boot as high as \$2,400 in the most egregious case.

But "let's just call it what it is," he says of such practices: "Stealing from truck drivers." (Picture of Richmond above by Denise Marhoefer.)